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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/717,805
Filing Date: November 20, 2003
Appellant(s): PARRINI, LORENZO

William J. Clemens
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11 February 2008 appealing from the Office action mailed 13 September 2007.

(1) Real Party in interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct. Examiner takes exception to appellant's statement, however, with respect to the last paragraph of Page 4, commencing with "Up to now steel cables have been used in elevator construction..." in that per the prior art of record, a transition from the use of predominantly steel cables to synthetic cables has been in process for more than a decade.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,566,786	De Angelis	10-1996
4,956,039	Olesen et al	09-1990
6,162,538	LaNieve et al	12-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 5, 10 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The arrangement and distribution of a reinforcing material in a base material, wherein said reinforcing material is in the form of at least one of spheres, grains, capsules, discs and plates, whereby the modulus of elasticity of a fiber containing said reinforcing materials is increased in a longitudinal direction of said fiber is called into question.

The disclosure of the instant invention reviews a random as well as parallel distribution of reinforcing material, wherein the modifiers random and parallel refer to the orientation of the reinforcing material.

As addressed in the prior art of reference of the previous office actions and as newly cited within this office action, the use of randomly orientated (pseudoisotropic) reinforcing material provides the least strength, in comparison to unidirectional (parallel) and bidirectional orientation.

Consequently, a reinforcing material comprising either spheres, grains, capsules, discs or plates, wherein said material has a higher stiffness than the base material, would result in localized concentration of stresses that would compromise the longitudinal elasticity of the base material, rendering the base material less resilient to loading.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8 and 14 recite the limitation "... said second phase reinforcing material increases a modulus of elasticity of said fibers in a radial direction of said fibers", whereby the respective independent claim from which the aforementioned claims depend recite "...increases modulus of elasticity of the strands in a longitudinal direction of said fibers..." Therefore, it is unclear whether the depending limitation is to replace the independent limitation or it is to be in addition to the independent limitation, e.g. "... said second phase reinforcing material increases a modulus of elasticity of said fibers in both a radial direction and a longitudinal direction of said fibers"

For purpose of prosecution, the former (e.g. radial direction only) will be applied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 7, 9 - 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Angelis (5,566,786) in view of Olesen et al (4,956,039).

In Claims 1, 3, 4, 6 – 7 and 9, De Angelis discloses an elongated load-bearing support device (1) with load bearing strands (4), each having a plurality of fibers (5) of a base material in a first phase (aramid fibers (Col. 2, Line 38)) and the strands being surrounded by a sheath (7). The reinforcing material of De Angelis is of a second phase, yet it is externally applied to the base material as "... an impregnating medium, for example polyurethane solution..." (Col.3, Line 57) whereby the bending fatigue strength of the strands is increased.

Attention is directed to Olesen et al, as cited for reference in previous office actions, who disclose the application of a thermoplastic sleeve that "...is preferably filled with reinforcement elements having a high modulus of elasticity..." (Col. 2, Line 60), as well as a core string comprising a thermoplastic material with filaments of "...preferably E-glass... S-glass... aramid or carbon...", whereby the distribution of reinforcing material of one phase within a base material of another (second) phase is taught. Furthermore, since the objective of the Olesen et al reference was "...to provide a method or an apparatus for the economical manufacture of a cable-like synthetic composite body which satisfies the requirements of being able to bear relatively high tensile and compressive forces in every respect...", it would have been obvious to one of ordinary skill in the art to modify the base material of De Angelis with the teaching of Olesen et al, in order to gain the commercial and structural (performance) features.

In Claim 2, De Angelis discloses his strands having a plurality of fibers (5) formed into a cable (4 and, in total, 1).

In Claims 5 and 10, as noted above, Olesen et al disclose a reinforcing material as "... staple fibers (23) of a high modulus of elasticity..." which is used to fill the base material (13) of thermoplastic material.

Regarding Claims 11 – 13 and 15, the devices of Claims 1 - 6 would necessarily have to be formed in order to function. It would have been obvious to perform all the method steps of claims 1 - 6 when producing the device of De Angelis as modified by Olesen et al above, in a usual and expected fashion, in as much as the method claims recite no limiting steps beyond producing each of the components.

In Claim 11, De Angelis, discloses an elongated load-bearing support device (1) with fibers (5) from a base material in a first phase (aramid fibers) and a reinforcing material in a second phase ("... an impregnating medium, ...polyurethane solution), with the load-bearing strands (4) thereof being surrounded by a sheath (7).

Olesen et al, however, teach a thermoplastic material that can be "...polypropylene filled with 20% E-glass staple fibers... (Col. 7, Line 7) whereby the glass fibers significantly increase the modulus of elasticity of each of the fibers in the longitudinal direction. Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of De Angelis with the teaching of Olesen et al, in order to provide a base material of superior tensile strength.

In Claim 12, De Angelis and discloses a base material selected from aramid.

In Claim 13, De Angelis discloses a reinforcing means by impregnation with a polyurethane solution to increase the bending fatigue strength of the base material, whereas Oleson et al teach a reinforcing material as "...E-glass staple fibers ..." as "... having a high modulus of elasticity...".

In Claim 15, Olesen et al teach "reinforcement elements... in particular staple fibers..." (Col. 2, Line 61) and that the staple fibers be of "... glass, aramid or carbon..." (Col. 4, Line 5), whereby staple fibers are understood to be short fibers.

Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Angelis in view of LaNieve et al (6,162,538).

De Angelis discloses an elongated load-bearing support device (1) with load bearing strands (4), each having a plurality of fibers (5) of a base material in a first phase (aramid fibers (Col. 2, Line 38)) and the strands being surrounded by a sheath (7). The reinforcing material of De Angelis is of a second phase, yet it is externally applied to the base material as "... an impregnating medium, for example polyurethane solution, for the protection of the fibers 5" to increase the bending strength.

Attention is directed to LaNieve et al, as cited for reference in previous office actions, who teach, "... polymers have been mixed with particulate matter and made into fibers..." (Col. 1, Line 54), whereby the particulate matter of their invention being "...an elemental metal or metal alloy, or may be nonmetallic..." (Col. 6, Line 14), whereby their polymer is an aromatic polyamide known as aramid. La Nieve et al teach further that such addition of particulate matter will enhance the flexural strength (modulus of elasticity in shear) of the fiber.

It would have been obvious to one of ordinary skill in the art to modify the base material of De Angelis with the teaching of LaNieve et al, in order to gain the features of materials of high flexural strength for applications whereby the material is to maintain a load while experiencing frequent/continuous radial deflection, for safety and durability.

(10) Response to Argument

With respect to the rejections of **Claims 5, 10 and 15** under 35 U.S.C. 112, first paragraph, in response to claim language in which the distribution of reinforcing material (material of a second phase) in a base material (material of a first phase) will increase the modulus of elasticity of the strands (the strands being of said first phase) in a longitudinal direction is called into question by the previously cited prior art of record as well as the prior art cited as being pertinent to the instant invention in which the review of random versus parallel, as well as bi-directional, orientation of reinforcing materials, of either fibrous or particulate form, are reviewed in depth. As stated in the rejection,

the localized concentration of stresses attributable to a randomly distributed reinforcing material having a higher stiffness than that of a base material, such as the spheres, grains, capsules, discs or plates as claimed, would degrade the modulus of elasticity of a fiber a longitudinal direction as understood by one having ordinary skill in the art.

The appellant's argument that "while random distribution and parallel distribution of the reinforcing material may result in different values, both create an increase in the modulus of elasticity of the strands in a longitudinal direction of the fibers..." (Page 8, 2nd para.) is not convincingly demonstrated/explained, in that a parallel distribution is associated with a reinforcing material comprising fibers whereas a random distribution is associated with reinforcing material comprising spheres, grains, capsules, discs and/or plates. In fact, with respect to the latter reinforcing materials, their contribution in increasing a modulus of elasticity would be limited to that of a *radial* direction of a fiber, as supported repeatedly by the prior art deemed pertinent to the instant invention as well as the reference of LaNieve et al as cited above (See Col. 6, L. 43 as well).

With respect to the rejections of **Claims 8 and 14** under 35 U.S.C. 112, second paragraph, the claim language clearly recites an increase in modulus of elasticity in a *radial* direction whereas the independent claims from which said claims depend recite an increase in modulus of elasticity in a *longitudinal* direction – only. Consequently, in view of the disclosure, the claim language of said dependent **Claims 8 and 14** was interpreted as an increase in modulus of elasticity in a *radial* direction – in the alternative to the *longitudinal* direction - as supported by the disclosure and concurred as much by appellant in that "... the specification that the modulus of elasticity of the entire fiber in the longitudinal direction and/*or* the transverse direction is increased" (Page 8, 3rd para.). Therefore, the prosecution of the claims was in accordance to the recitation of the claim language.

With respect to appellants arguments to the rejections of **Claims 1 – 7, 9 – 13 and 15**, in particular the rejections of **Claims 1 and 7**, appellant incorrectly argues that neither the reference of De Angelis et al or Olesen disclose "... or suggest any new

phase introduced in the bulk of the fibers. The fibers disclosed in both documents consist of only one phase" (Page 10, 4th para.).

As reviewed in the rejections, De Angelis et al disclose "Each individual strand 4 is treated with an impregnating medium, for example a polyurethane solution, for the protection of fibers 5" (Col. 3, L. 56). De Angelis et al disclose further that "The higher the portion or share of polyurethane, the higher becomes the bending fatigue strength. However, the carrying capacity and the modulus of elasticity ... fall with increasing portions of polyurethane. The polyurethane utilized for the impregnation of strands 4 can, according to the desired bending fatigue strength, vary, for example, between 10 and 60%" (Col. 3, L. 60 - 67), wherein the fibers are of aramid (aromatic polyamide).

Therefore, De Angelis et al disclose the introduction of a material of a second phase in a material of a first phase for an increase of the bending strength of said material of a first phase, in keeping with said material of said first phase being impregnated with a material of a first phase, whereby the definition of the verb "to impregnate", according to Merriam-Webster's Dictionary, is "... to cause to be filled, imbued, permeated, or saturated..." Hence, a by-product of the fiber being impregnated with polyurethane is a loss in its load-carrying capacity (modulus of elasticity) in a longitudinal direction.

Appellant argues further that the strands, not each individual fiber, of De Angelis et al are treated with the impregnation medium. First of all, though each fiber may not be individually treated, this in itself does not contradict the claim language. Secondly, by treating the strands, the fibers of De Angelis et al, whether in total or in part, are treated as well, as stated as such in the excerpt above and as known to one having ordinary skill in the art.

De Angelis et al, however, address an increase of modulus of elasticity in a radial direction.

Therefore, attention was directed to Olesen in which the addition of materials in a second phase are introduced to a material of a first phase, wherein the material of a first

phase is one of various thermoplastics (Col. 4, L. 15) and the materials of second phase being "… staple fibers of glass, aramid, or carbon…" and whereby a particular composite structure comprises "… polypropylene with E-Glass staple fibers…" (Col. 4, L. 5 – 9), in keeping with the invention of Olesen to "… provide a cable-like synthetic composite body which satisfies the requirements of being able to bear relatively high tensile and compressive forces in every respect and (sic) which has adequate bending stiffness..." (Col. 2, L. 45), thereby increasing the modulus of elasticity in a longitudinal direction.

The appellant argues that the focus of Olesen is placed on the sleeve layer(s) and not to a load-bearing fiber itself. However, Olesen teaches further the "… degree of filling of the second thermoplastic synthetic material with the reinforcing fibers amounts to from 10 to 80%..." (Col. 4, L. 10) as well as the intimate bonding of the sleeve layers with a core string, through an extrusion process at elevated temperatures, enabling the reinforcing fibers of the sleeves to "… partially penetrate into the desired first thermoplastic material, so that the tensile and pressure forces acting on the sleeve are transmitted to the core string" (Col. 2, L. 56 – Col. 3, L. 16), whereby the core string consists of "...endless filaments" and forms a unitary, composite body with the sleeves and their reinforcing materials.

Therefore, Olesen teaches the introduction of a reinforcing material (second phase) into a fiber (first phase) for purpose of enhancing the tensile strength of a fiber for purpose of increasing its modulus of elasticity in a longitudinal direction.

With respect to **Claims 8 and 14**, the reference of LaNieve et al teaches the addition of particulates, either metallic or non-metallic as reviewed above, in aramid fibers for the enhancement of the flexural strength of the fibers without significantly reducing the tensile strength of the fiber, this being the inventive feature of their invention (Col. 3, L. 27 – 35), as reviewed in previous office action(s).

Therefore, La Nieve et al teach the enhancement of their shear strength at a minimized cost to their tensile strength, thereby increasing a modulus of elasticity of their fibers in a radial direction and, therefore, meeting the claim language.

As an additional comment with respect to the rejections under 35 U.S.C. 112, first paragraph of Claims 5, 10 and 15, attention is directed to La Nieve et al (Col. 6, Lines 34 - 44), in which the use of platelets and needles as reinforcing material are addressed with the cautionary statement that the "... particles should be small enough that the fiber (base material, sic) tensile properties do not appreciably deteriorate..."

Consequently, appellant's arguments with respect to the teachings of LaNieve et al, in particular the cited excerpt from their disclosure (Page 14, final para.), are not persuasive in that the excerpt is a statement with respect to the prior art at the time of their invention and not with respect to their inventive feature(s) as reviewed above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Stefan Kruer/
Examiner, Art Unit 3654
28 March 2008
Conferees:

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/Peter M. Cuomo/

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